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**ICF/SRW ASSOCIATES INC.**  
An ICF Technology Company  
Robinson Plaza II Suite 200  
PITTSBURGH, PENNSYLVANIA 15205

# LETTER OF TRANSMITTAL

(412) 788-9200

DATE	March 17, 1989	JOB NO	30160.000.01
ATTENTION	Mr. Harry Daw (3HW14)		
RE	ORIGINAL P-4		

TO Cercla Removal Enforcement Section  
U.S. EPA, Region III  
841 Chestnut Building

Philadelphia, PA 19107

AIRBORNE EXPRESS

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via \_\_\_\_\_ the following items:

- ☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications  
☐ Copy of letter ☐ Change order ☐ \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
2	March 1989		Work Plan, Offsite Drainage Ditch Stabilization NVF Company, Kennett Square Facility

THESE ARE TRANSMITTED as checked below:

- ☐ For approval ☐ Approved as submitted ☐ Resubmit \_\_\_\_\_ copies for approval  
☒ For your use ☐ Approved as noted ☐ Submit \_\_\_\_\_ copies for distribution  
☒ As requested ☐ Returned for corrections ☐ Return \_\_\_\_\_ corrected prints  
☐ For review and comment ☐ \_\_\_\_\_  
☐ FOR BIDS DUE \_\_\_\_\_ 19 \_\_\_\_\_ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

We have been requested by Harley Trice of NVF to transmit two copies of the Work Plan to you.

COPY TO \_\_\_\_\_

SIGNED: \_\_\_\_\_

If enclosures are not as noted, kindly notify us at once.

Tracey O'Keefe, P.E.

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ORIGINAL  
(2)

## 1.0 BACKGROUND

In response to a Unilateral Order dated March 31, 1988, the NVF Company (NVF) performed an investigation and remediation of three areas outside the boundaries of its Kennett Square, PA facility. Subsequently, ICF performed an investigation of an off-site drainage ditch immediately south of the plant property line to evaluate the extent of PCB contamination in soils, sediments and ground water. Results of the drainage ditch investigation were presented to the EPA in January 1989, and were accepted by EPA as adequately defining the vertical and areal extent of PCB contamination in the drainage ditch (EPA letter to W. Witt, 2/9/89).

This work plan outlines the approach proposed by NVF to remediate the ditch, and provides information relative to the design, construction, construction monitoring, and periodic inspection/maintenance of the remedial method. A review of the remedial design and an evaluation of the long term performance and integrity of the proposed remedial method is presented in a letter dated March 16, 1989 addressed to William Witt, P.E. of NVF Company.

## 2.0 DITCH STABILIZATION PLAN

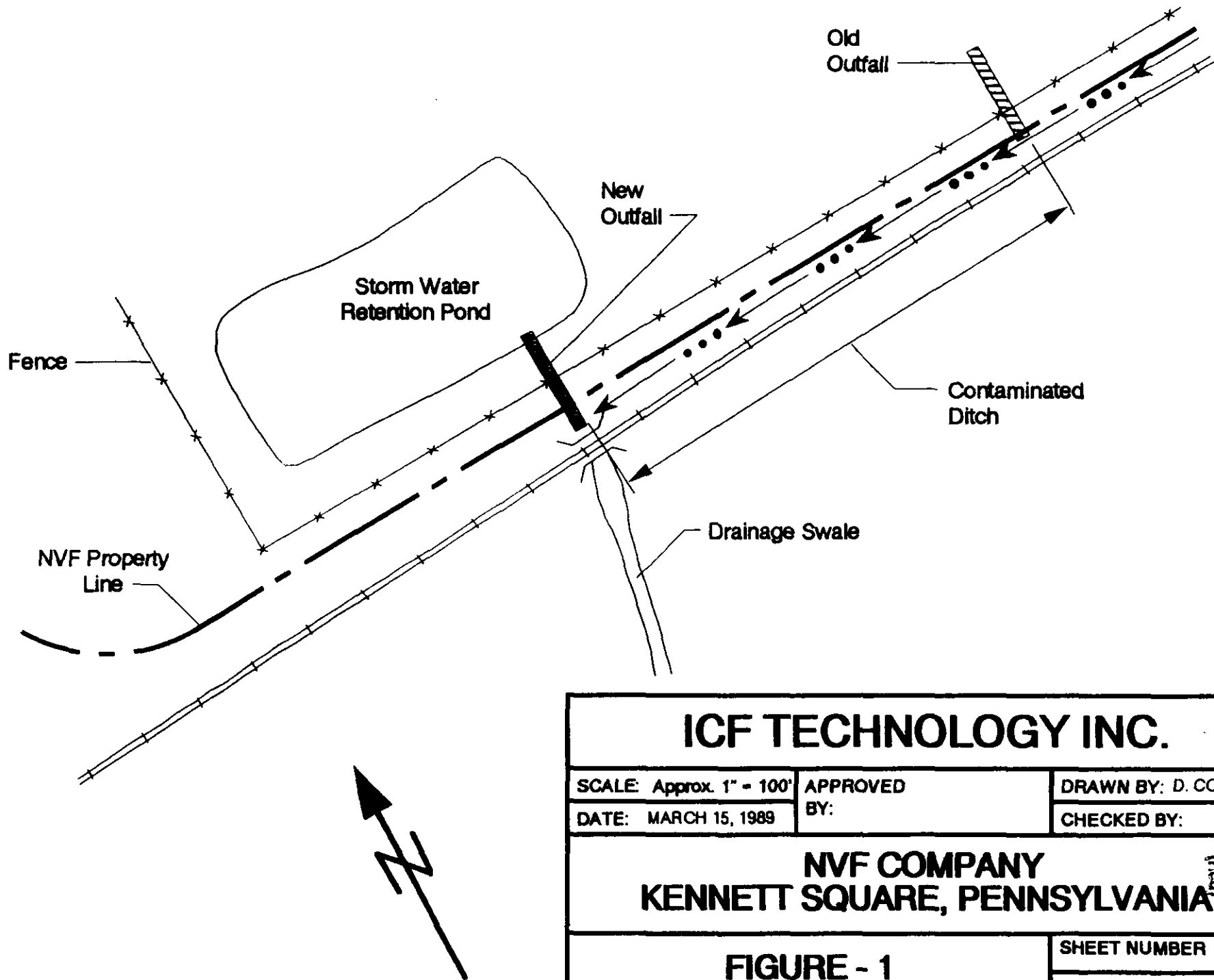
NVF proposes to use a multi-layered liner and cap (liner/cap) system to remediate the off-site drainage ditch. The proposed system is designed to effectively perform the following functions:

1. Provide long term erosion control to prevent the erosion of PCB-contaminated soils from the ditch.
2. Minimize infiltration of surface waters flowing within the ditch to minimize the spread of subsurface contamination.
3. Isolate contaminated soils in the ditch to prevent direct human contact.

### 2.1 Liner/Cap Description

The proposed liner/cap system would extend along the length of the ditch (approximately 400 feet) from the old outfall to the new outfall, as shown on Figure 1. Laterally, the liner/cap would extend from the NVF fence line across the ditch and up the railroad embankment on the other side of the ditch. The proposed configuration will cap the ditch area adjacent to the NVF facility between NVF's old outfall and the new outfall (See Figure 1).

The liner/cap system would consist of three components. These include a layer of a geotextile fabric (Mirafi 500X); a commercially manufactured composite liner material (Claymax), which has been designed for hazardous waste landfill applications; and an overlying concrete "cap" to protect the liner and prevent erosion. The concrete cap will consist of a 4-inch-thick commercially manufactured fabric "form" (Fabriform Unimat) filled with a cement-based



# ICF TECHNOLOGY INC.

SCALE: Approx. 1" = 100'

APPROVED  
BY:

DRAWN BY: D. COULTER

DATE: MARCH 15, 1989

CHECKED BY:

**NVF COMPANY**  
**KENNETT SQUARE, PENNSYLVANIA**

ORIGINAL  
(Red)

**FIGURE - 1**  
**SITE PLAN**

SHEET NUMBER 1 of 1

DRAWING NUMBER

301

AR100519

grout. This material is designed to prevent stream and beach erosion, and is widely used in this type of application. A cross section of the liner/cap system is presented in Figure 2.

The Mirafi 500X is a woven geotextile and will be placed on the prepared ground surface as the bottom layer of the proposed multi-layer liner/cap system. This material is included to provide additional structural strength to the liner/cap system.

The Claymax liner is composed of a layer of very low-permeability bentonite sandwiched between a non-woven polyester fabric on the bottom, and a durable woven polypropylene geotextile on the top. The woven polypropylene fabric is resistant to punctures and tears, and provides mechanical strength and stability during installation of the liner. The Claymax mats are to be placed along the length of the ditch in a direction perpendicular to the land contours, with adjacent rolls overlapping a minimum of 6 inches. This procedure is in accordance with the manufacturer's specifications for use of the material in hazardous waste landfill liners and caps. The Claymax material will intercept water which may penetrate the concrete cap and effectively control surface water infiltration.

The Fabriform Unimat system consists of porous woven synthetic fabric forms into which a concrete-based grout is injected to form a strong, durable, crack resistant four-inch thick concrete blanket. The fabric is immune to attack by acids, alkalis, organic solvents, and biological agents. A mixture of one percent noncorrosive polypropylene fibers will be added to the grout to reinforce the grout and minimize shrinkage and cracking during curing.

The above liner materials were chosen based on their performance characteristics and their demonstrated ability to perform their intended function in similar installations. All materials will be installed according to the manufacturer's recommendations.

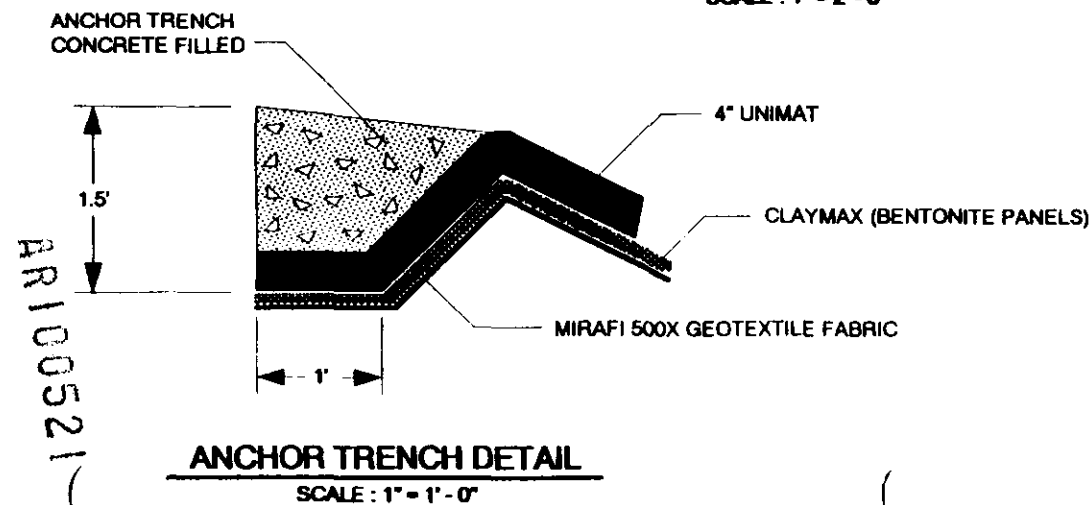
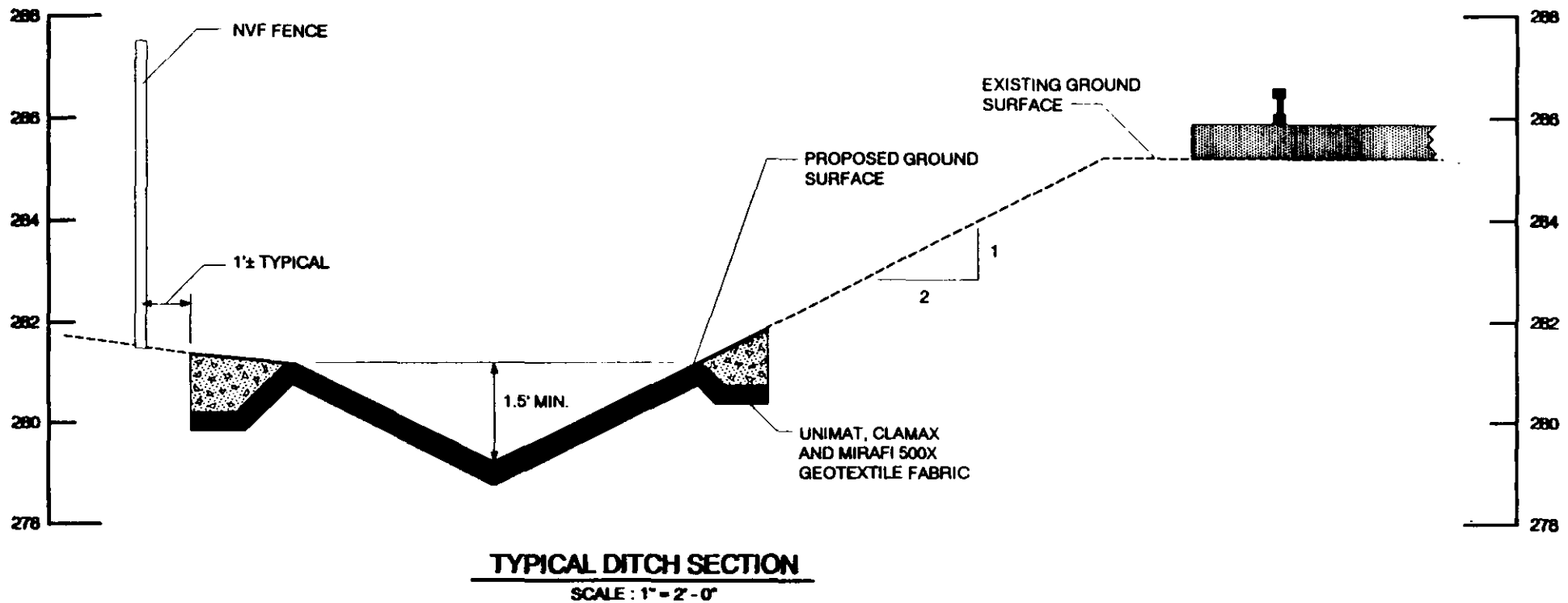
### 3.0 INSTALLATION

The following methods will be used by Remcor Incorporated (Remcor), NVF's construction contractor, to install the proposed liner/cap. All work will be conducted in accordance with a worker health and safety protection plan previously developed for off-site removal actions at the NVF facility.

#### 3.1 Construction of Proposed Liner/Cap

##### Mobilization

Remcor will mobilize the necessary personnel, equipment, and materials to the NVF Kennett Square Plant. Major equipment items include a small track-mounted front-end loader/backhoe, grout pumps, health and safety gear, and hand tools. Needed materials, which will be staged on NVF property near the work area, include the liner/cap materials (Mirafi 500X, Claymax mats, Fabriform materials, cement-grout, etc.).



<b>ICF TECHNOLOGY INC.</b>		
SCALE: As Shown	APPROVED BY:	DRAWN BY: D. COULTER
DATE: MARCH 15, 1989	CHECKED BY:	
<b>NVF COMPANY</b> <b>KENNETT SQUARE, PENNSYLVANIA</b>		
<b>FIGURE - 2</b> <b>TYPICAL SECTION</b>		SHEET NUMBER 1 of 1
		DRAWING NUMBER 30160-1

## Site Preparation

Upon mobilization to the site, one or more sections of the NVF property fence will be temporarily removed to improve access to the work area. The work area will then be cordoned off, as necessary, by stringing barricade tape between the previously placed posts.

The existing rock check dam will be removed and replaced by a sandbag dike at the downstream end of the ditch near it's confluence with the drainage swale. The rock from the check dam will be relocated to enlarge the existing check dam on the west side of the drainage swale. The existing silt fencing will, to the extent possible, be incorporated into the replacement silt fence on the upstream face of the sandbag dike.

The bottom and lower sides of the ditch will then be cleared of debris and other materials, including rocks greater than two inches in diameter, straw mulch, and trash. The surface of the ditch will be graded to remove vegetation and establish a more-uniform shape. This grading will be performed to achieve stable side slopes. As necessary the ditch will be hand groomed.

The cleared materials and any excess soil from the grading will be placed in stockpiles within a paved area on the NVF site; these stockpiles will be lined and covered with polyethylene sheeting. The stockpiled material will subsequently be sampled for PCB content. Samples will be collected from the stockpile and sent to a certified laboratory for PCB testing. This testing will determine the final disposal of this material as either non-PCB or PCB waste.

Anchor trenches, minimally 12 inches wide and 18 inches deep, will then be excavated along all four sides of the ditch area to be stabilized. The upstream anchor trench will be at least 30 inches deep. These trenches will be excavated using the loader/backhoe and hand tools. Excavated soils will be used in grading of the channel; any excess soils will be placed with the stockpiled materials designated for off-site disposal.

## Ditch Liner/Cap Placement

Lining of the drainage ditch will be performed beginning at the upstream end of the ditch at Old Outfall 001. Following the placement of the Mirafi 500X, Claymax panels will be placed in the upstream anchor trench and spread out downstream over the placement area. Each panel will be 82 feet long and extend laterally into both side anchor trenches. The five panels needed will be placed in sequential fashion in the downstream direction. Individual panels will be overlapped a minimum of 6 inches. Following the installation of the Claymax, the liner will be visually inspected and photographed to document proper installation. Fabriform Unimat will then be placed on top of the liner. The Unimat will first be placed in the upstream and perimeter (side) anchor trenches and spread in sections over the placement area. The individual sections of Unimat will be field sewn in accordance with the manufacturer's recommendations. The final placement section will be secured in the downstream anchor trench.

Once in place, cement grout will be pumped into the Unimat, forming a continuous, four-inch thick durable lining. The water in the grout mix will wet the underlying Claymax, causing the bentonite to expand. The grout will be a sand-cement mixture with five to eight percent entrained air and approximately one percent noncorrosive polypropylene fibers. The described additives provide for increased freeze/thaw durability and minimize shrinkage cracking during curing. The perimeter anchor trenches will also be backfilled with cement grout.

As sections of the ditch stabilization are completed, the surface will be covered with burlap to provide for moist curing of the cement grout. Excess water from the filling of the Unimat will be collected at the downstream check dam and pumped to the storm water detention pond at the NVF site.

#### Site Restoration and Demobilization

Upon completion of the ditch stabilization, the work areas will be restored as needed. Work areas along the ditch will be graded, seeded, and mulched to prework conditions. The NVF property line fence will be re-erected, and the silt fencing and warning posts/tape will be removed.

Surfaces of equipment used in the installation that potentially contacted PCB-contaminated soils will be decontaminated with detergent and water solutions. Spend wash water will be collected in drums for subsequent off-site disposal. Disposable items (e.g., certain worker health and safety protection equipment, silt fencing, etc) will be placed with materials designated for off-site disposal. Remcor will then demobilize from the site.

#### 3.2 Proposed Work Schedule

The following schedule is proposed following EPA's approval of the work plan for the installation of the liner/cap system. It assumes no delays due to inclement weather or delays in liner/cap material delivery. Site work will not proceed during periods of subfreezing temperatures or significant precipitation.

Materials Procurement and Mobilization	20 Work Days
Field Installation	16 Work Days
<u>Site Restoration and Demobilization</u>	<u>4 Work Days</u>
Total Project	40 Work Days

#### 4.0 INSPECTION/MAINTENANCE PROGRAM

The stabilization plan has been developed to prevent erosion of PCB-contaminated soils from the bottom of the ditch and minimize the potential for transport of such contaminated sediments via surface water to downstream receptors. "Failure" of the stabilization system implies the loss of this erosion protection by one or more of the following:

- Scouring of soils from around and underneath the edges of the stabilized area.
- Cracking and loss of sections of the concrete cap, exposing the underlying liner and/or soil to erosion.

#### 4.1 Monthly Inspection/Maintenance

A program of routine monthly inspection and maintenance of the ditch liner/cap system will be performed to identify and correct either of the above failure mechanisms. Monthly inspections will be performed by NVF personnel. These inspections will focus on the condition of the cap, and soil conditions near the edge of the covered area. Evidence of scouring, animal burrowing, or concrete cap cracking will be reported to EPA, and necessary repairs will be implemented by NVF (or subcontracted) personnel. Needed repairs may involve localized soil placement or liner/cap patching.

#### 4.2 Annual Inspections

An annual inspection of the liner/cap system will be performed by a registered professional engineer who is familiar with the liner/cap system utilized at the site. The engineer will photograph the installation and complete the attached inspection report, a copy of which will be provided to both NVF and EPA.

ANNUAL INSPECTION CHECKLIST/REPORT  
OFFSITE DRAINAGE DITCH LINER/CAP  
NVF COMPANY  
KENNETT SQUARE, CHESTER COUNTY, PENNSYLVANIA

Date of Inspection: \_\_\_\_\_  
Weather Conditions: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Inspection Personnel: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

No. of Photos Taken: \_\_\_\_\_

<u>EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS</u>
CONCRETE SURFACES:		
Surface Cracks		
Spalling		
Loss of Concrete		
Unreported Repairs		
Discoloration		
ALIGNMENT:		
Vertical		
Horizontal		
CONSTRUCTION JOINTS:		
Cracks		
Spalling		
Loss of Concrete		
Unreported Repairs		
Discoloration		
Uneven Alignment		
UNUSUAL MOVEMENT		
Frost Heave		
Settlement		
EROSION/SOIL LOSS:		
Side Slopes		
Upstream Anchor Trench		
Downstream Anchor Trench		
Side Anchor Trenches		
Animal Burrowing		

ORIGINAL  
(Red)

ANNUAL INSPECTION CHECKLIST/REPORT  
OFFSITE DRAINAGE DITCH LINER/CAP  
NVF COMPANY  
KENNETT SQUARE, CHESTER COUNTY, PENNSYLVANIA  
(Continued)

<u>EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS</u>
APPROACH CHANNEL		
Condition		
Vegetation		
Debris		
Erosion		
Sediment Accumulations		
DISCHARGE CHANNEL		
Condition		
Vegetation		
Debris		
Erosion		
Sediment Accumulations		

THIS IS TO CERTIFY THAT THE ABOVE FACILITY WAS INSPECTED ON THIS DATE AND THE ABOVE OBSERVATIONS AND REMARKS RESULTED FROM THIS INSPECTION.

\_\_\_\_\_  
Signature of Registered Professional Engineer

Date: \_\_\_\_\_

cc: NVF Company  
EPA, Region III